



Installation Guide BroadLink ADSL Router Model No. SP3353

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CE Declaration of conformity

This equipment complies with the requirements relating to electromagnetic compatibility, EN55022 class A for ITE, the essential protection requirement of Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

FCC Warning

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limitations are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ☒ Reorient or relocate the receiving antenna.
- ☒ Increase the separation between the equipment and receiver.
- ☒ Connect the equipment into a different outlet from that the receiver is connected.
- ☒ Consult your local distributors or an experienced radio/TV technician for help.
- ☒ Shielded interface cables must be used in order to comply with emission limits.

Changes or modifications to the equipment, that are not approved by the party responsible for compliance could affect the user's authority to operate the equipment.

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Chapter 1

About This ADSL Router

1.1. Congratulations!

Congratulations on your purchase of Micronet's BroadLink ADSL Router. This router is offering complete ADSL telecommunications and networking solutions for your home or branch office. This chapter provides an overview of the asymmetric digital subscriber line (ADSL) Discrete Multi-Tone (DMT) router.

1.2. Micronet Limited Warranty

Micronet warrants to the original end user (purchaser) that this product is free from any defects in materials or workmanship for a period of up to two (2) years from the date of purchase.

During the warranty period, and upon proof of purchase, should the product have indications of failure due to faulty workmanship and/or materials, Micronet will, at its discretion, repair or replace the defective products or components without charge for either parts or labor, and to whatever extent it shall deem necessary to restore the product or components to proper operating condition. Any replacement will consist of a new or re-manufactured functionally equivalent product of equal value, and will be solely at the discretion of Micronet.

This warranty shall not apply if the product is modified, misused, tampered with, damaged by an act of God, or subjected to abnormal working conditions.

Note: Repair or replacement, as provided under this warranty, is the exclusive remedy of the purchaser. This warranty is in lieu of all other warranties,

express or implied, including any implied warranty of merchantability or fitness for a particular use or purpose. Micronet shall in no event be held liable for indirect or consequential damages of any kind of character to the purchaser.

To obtain the services of this warranty, contact Micronet's Service Center; refer to the separate Warranty Card for your Return Material Authorization number (RMA). Products must be returned Postage Prepaid. It is recommended that the unit be insured when shipped. Any returned products without proof of purchase or those with an out-dated warranty will be repaired or replaced (at the discretion of Micronet) and the customer will be billed for parts and labor. All repaired or replaced products will be shipped by Micronet to the corresponding return address.

1.3. Customer Support

If you have questions about your Micronet product(s) or desire assistance, please contact Micronet Communications Corporation offices in Taiwan. The telephone number is 886-2-22183656. Our technical support email address support@micronet.info is also available.

1.4. ADSL Router SP3353

SP3353 is an ADSL router used for Internet/LAN access via an ADSL line. SP3353 can run maximum upstream transmission rates of 1Mbps and maximum downstream transmission rates of 8Mbps. The actual rate depends on the copper category of your telephone wire, distance from the central office and the type of ADSL service subscribed to. See the sections below for more background information on DSL and ADSL.

The SP3353's 10/100M auto-negotiating LAN interface enables fast data transfer of either 10Mbps or 100Mbps in either half-duplex or full-duplex mode depending on your Ethernet network.

Micronet's ADSL Router SP3353 is easy to install and to configure. All functions of the Router are software configurable via the Web-based management Interface.

1.5. About This User's Guide

This user's guide covers all aspects of the SP3353 operations and shows you how to get the best out of the multiple advanced features of your ADSL Internet Access Router. It is designed to guide you through the correct configuration of your SP3353 for various applications.

1.6. Package Information

Before you start, please check all the contents of this package. The product package should include the following:

- One ADSL Router
- One power adapter
- One UTP cable
- User's Manual CD-ROM
- Quick Installation Guide

1.7. Product Specifications

Standard

- ITU G.992.1 (G.DMT) AnnexA / AnnexB
- IEEE802.3, 10BASE-T
- IEEE802.3u, 100BASE-TX
- IEEE802.3u full duplex operation and flow control

Interface

- 1 * ADSL WAN port
- 4 * 10/100 RJ-45 Fast Ethernet switching ports

WAN Connection

SP3353: 1 * RJ-11 WAN port for AnnexA Type

SP3353/B: 1 * RJ-45WAN port for AnnexB (UR-2) Type

Network Data Rate

Ethernet: Auto-negotiation (10Mbps, 100Mbps)

ADSL: up to 8Mbps downstream and 1Mbps upstream

Transmission Mode

Auto-negotiation (Full-duplex, Half-duplex)

LED Indications

System – Power, Status

Port (ADSL) – LINK, ACT

Port (Ethernet) – SPEED, LINK, FDX/COL

Software Support

Embedded Web based management interface

LAN/WAN management via Telnet or Web-based management interface

DHCP client/server/relay function

Internet game and multi-media applications support

Firmware upgradeable

PPPoA and PPPoE protocol

Static/Dynamic routing

NAT/NAPT function

Port filtering

Security triggers

IP filtering

Intrusion detection

SNMP v1, v2 and v3 management

VPN PPTP supported

Buffer Memory/MAC address

128Kbyte/4K MAC address table

Emission

FCC Class B. CE

Operating Environment

Temperature 0 degree C to 50 degree C

Humidity 10% to 90%

Power Supply

External Power Adapter, 12VDC/1000mA

ADSL (Asymmetric Digital Subscriber Line)

2.1. What is ADSL?

ADSL is an asymmetrical technology, meaning that the downstream data rate is much higher than the upstream data rate. It enhances the data capacity of the existing twisted-pair wire that runs between the local telephone company switching offices and most homes and offices. ADSL is suitable for Internet users because more information is usually downloaded than uploaded. For example, a simple button click in a web browser can start an extended download that includes graphics and text. ADSL operates in a frequency range that is above the frequency range of voice services, so the two systems can operate over the same cable.

The advantages of ADSL form the point of view of the Network Service Provider and the end users:

1. ADSL enables Telcos to use the existing copper wires around the world to deliver affordable high-speed remote access to the Internet, corporate networks and on-line services over ordinary phone lines.
2. There is no time wasted for dialing up, ADSL is “always on” and connected, waiting ready for use.
3. ADSL provides service providers with the capability to use one line to provide new data services while maintaining the telephone service on the same line, thus no need to increase any new infrastructures.
4. This new technology empowers the communicating speed nearly 300 times faster than 24.4 Kbps modems or over 100 times faster than 56Kbps modems.
5. ADSL enables real-time interactive multimedia applications, such as video

conferencing, distance learning and video-on-demand.

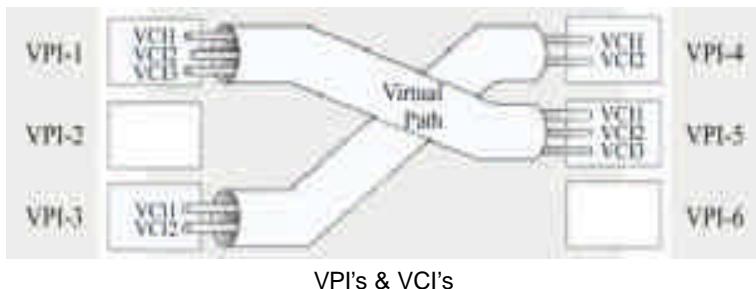
6. ADSL provides Telcos with the ability to offer a private, secure channel of communications between the consumer and the service provider.
7. Data stream travels along the customers' own line. It is quite unlike traditional telephone and modem services sharing the line with others.
8. Using a customer's dedicated line, ADSL transmission speeds are not affected by other users going on line.
9. You can use telephone for normal conversations and high-speed conduit for data, information, entertainment and more at the same time. It provides enormous advantages both in office and at home.

2.2. VPI & VCI

The valid range for the VPI is 1 to 255. The VCI is 32 to 65535 since 1 to 31 is reserved for local management of ATM traffic. Your Telecos should supply you with these numbers.

ATM is a connection-oriented technology. It sets up virtual circuits over which end systems communicate. The terminology for virtual circuits involves VC (virtual channel) and VP (virtual path). VC is the logical connections between end stations and VP is a bundle of VCs.

We can think of a VP as a cable that contains a bundle of wires. The cable connects two points, and wires within the cable provide individual circuits between the two points. In an ATM cell header, a VPI identifies a link formed by a virtual path and a VCI identifies a channel within a virtual path. The VPI and VCI are identified and correspond to termination points at ATM switched as shown below.



2.3. Multiplexing

There are two conventions to identify what protocols the virtual circuit (VC) is carrying. Be sure to use the multiplexing method required by your ISP.

VC-based multiplexing

Each protocol is assigned to a specific virtual circuit, e.g., VC1 carries IP, VC2 carries IPX, etc. VC-based multiplexing may be dominant in environments where dynamic creation of large numbers of ATM VCs is fast and economical.

KLC-based multiplexing

VC carries multiple protocols with protocol identifying information being contained in each packet header. Despite the extra bandwidth and processing overhead, this method may be advantageous if it is not practical to have a separate VC for each carried protocol, e.g., if charging heavily depends on the number of simultaneous VCs.

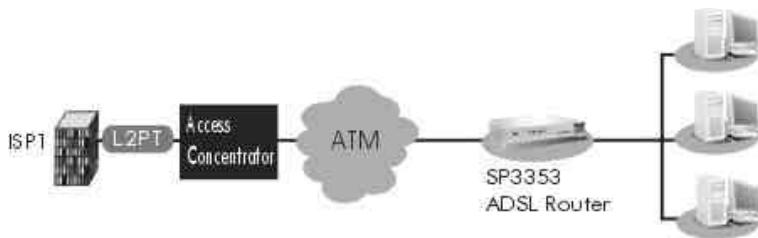
2.4. PPPoE

When using SP3353 as a PPPoE client, the PCs on the LAN see only Ethernet and are not aware of PPPoE. This alleviates the administrator from having to manage the PPPoE clients on the individual PCs.

What is PPPoE?

PPPoE (Point-to-Point Protocol over Ethernet) emulates a Dial-Up connection. It allows your ISP to use their existing network configuration with newer broadband technologies such as ADSL. The PPPoE driver on Micronet SP3353 is transparent to the PCs on the LAN, which see only Ethernet and are not aware of PPPoE thus saving you from having to manage PPPoE clients on individual PCs.

An ADSL modem bridges a PPP session over Ethernet from your PC to an ATM PVC (Permanent Virtual Circuit), which connects to a xDSL Access Concentrator where the PPP session terminates (see the figure below). One PVC can support any number of PPP sessions from your LAN. PPPoE provides access control and billing functionality in a manner similar to dial-up services using PPP.



BroadLink Sp3353 as a PPPoE Client

Like the architecture shown above, the PPPoE driver makes the Ethernet appear as a serial link to the PC, while the modem bridges the Ethernet frames to the Access Concentrator (AC). Between the AC and an ISP, the AC is acting as a L2TP (Layer 2 Tunneling Protocol) LAC (L2TP Access Concentrator) and tunnels the PPP frames to the ISP. The L2TP tunnel is capable of carrying multiple PPP sessions. With PPPoE, the VC (Virtual Circuit) is equivalent to the dial-up connection and is between the modem and the AC, as opposed to all the way to the ISP. However, the PPP negotiation is between the PC and the ISP.

Benefits of PPPoE

PPPoE offers the following benefits:

1. It provides a familiar dial-up networking (DUN) user interface.
2. PPPoE lessens the burden on the carriers of provisioning virtual circuits all the way to the ISP on multiple switches for thousands of users. For PSTN and ISDN, the switching fabric is already in place.
3. It allows the ISP to use the existing dial-up model to authenticate and to provide differentiated services.

Chapter 3

Introduction To Internet ADSL Router

Micronet's Broadlink™ SP3353 is an ADSL Router embedded ADSL modem and built-in 4-port auto-uplink Ethernet switch. Please prepare a PC with an Ethernet port before configure the ADSL Router.

3.1. The Front Panel

The front panel of the ADSL Router is shown below.

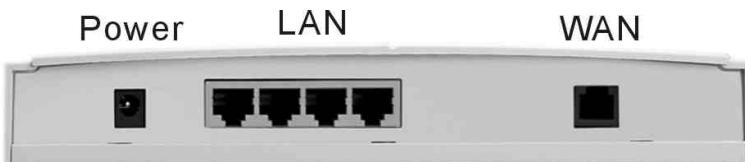


System LEDs	
Power	Lights green when the ADSL Router is receiving power.
Status	The LED will be dark for 10 seconds when the system is started. After that, the LED will blink periodically to show the ADSL Router is working normally. If the LED stays green/dark that means the system is fail, you need to try to reboot the system or contact your agent.
Port LEDs (ADSL)	
LINK	The LED stays light (green) means the port has good linkage to its associated devices.
ACT	The activity LED will blink green when there is traffic transfer to the port.

Port LEDs (LAN)	
FDX/COL	A collision occurs when two stations within a collision domain attempt to transmit data at the same time. Intermittent flashing amber of the collision LED is normal; the contending adapters resolve each collision by means of a wait-then-retransmit algorithm. Frequency of collision is an indicator of heavy traffic on the network. If the FDX/COL lights amber it means the port is under full-duplex operation or dark for half-duplex mode.
LINK/ACT	Every port has a LINK/ACT LED. Steady green (link state) indicates that the port has good linkage to its associated device. Flashing green indicates that the port is receiving or transmitting data between its associated devices.
SPEED	The SPEED LED indicates the link speed of each port. If the LED lights green then the connection speed is 100Mbps, off for 10Mbps.
Factory Setting Button	Push the button for 5 seconds, the system will return to factory default setting. In the meantime, system rewrite flash to default value and Status LED halts for a while. Approximately 60 seconds later, the Status LED blinks green periodically, now the whole system parameters have returned to factory default value. If the process has been interrupted by any reason (power off.....), the system will fail. Before performing the process, ensure a safe operating environment please!

3.2. The Rear Panel

The rear panel of the ADSL Router is shown below



Power Connection	Plug the circle end of the power adapter firmly into the rear panel of the ADSL Router, and the other end put into an electric service outlet then the system is ready.
LAN Connection	10BASE-T: Category 3,4 or 5 UTP/STP 100BASE-TX: Category 5 UTP/STP
WAN Connection	ADSL: RJ-11 for AnnexA (SP3353), RJ-45 ISDN for AnnexB (SP3353/B)

3.3. Installing And Using Internet ADSL Router

This section provides a step-by-step guide to the installation and configuration of the ADSL Router. It assumes that your computer uses the Windows 95/98 or newer version and a web browser is installed for configuration purposes. We suggest you go over the whole section and then do more advanced operation.

3.3.1. Network configuration setup

Steps to build up the network:

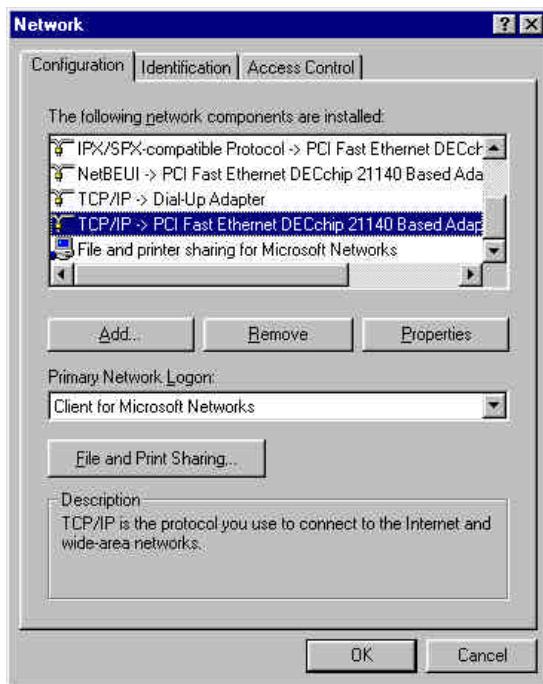
- (1) Check your ADSL service is enabled and splitter is well installed. If not, consult to your ISP.
- (2) Connect the phone line from the ADSL splitter to the RJ-45 port on the rear panel of the ADSL Router.
- (3) Install the network interface card into your computer by referring to the User Guide that came with the card.

- (4) Connect the computer to the ADSL Router by using standard twisted-pair cable from the computer's network interface card to an 10/100Mbps Ethernet port on the back of the ADSL Router.
- (5) Plug-in the power adapter to the ADSL Router and the other side to the wall outlet.

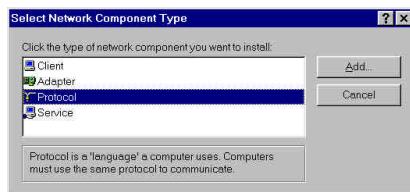
3.3.2. Computer configuration setup

In order to communicate with ADSL Router, the connected computer needs to install the TCP/IP protocol and setup the related address information.

- (1) Double click the "My Computer" icon on the desktop screen.
- (2) Double click the "Control Panel"  Network".
- (3) Click the "Configuration" tab and check the TCP/IP protocol is available or not. If yes, skip the procedures 4~5. If no, click the "Add" button.



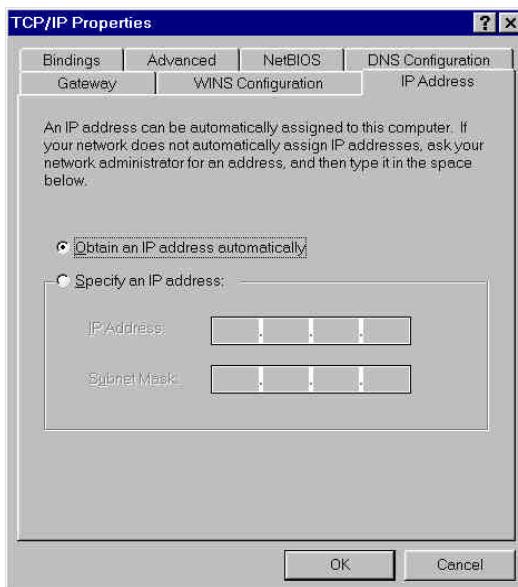
(4) Select “Protocol” item on the Select Network Component Type window.
After that, click “Add” button.



(5) Select “Microsoft” item on the left side of Select Network Protocol window.
After that, select “TCP/IP” protocol on the Network Protocols block and click “OK” button.

(6) Select the “TCP/IP” component in the Configuration tab of the Network window. Click “Properties” button.

(7) The screen will show up the TCP/IP Properties window then start the setting. First of all, you need to choose the IP address is dynamically assigned by a DHCP server or fixed.



Dynamically assigned:

- Select the "IP Address" tab and select "Obtain an IP address automatically" (default setting)
- Select the "Gateway" tab and click "Remove" to clear any existing entry of gateway IP address
- Select the "DNS Configuration" tab and click "Disable DNS"
- Click "OK" button

Fixed:

If there are some clients who need to get fixed IP addresses for some reasons and the nodes also need to access Internet through the ADSL Router then the following steps used to configure system

- Select "Specify an IP address" in the IP Address tab of the TCP/IP Properties window and enter 192.168.1.x in the IP Address field (the "x" is a number between 2 and 254 used by the ADSL Router to identify individual computers)
- Select the "DNS Configuration" tab and click "Enable DNS"
- Enter the DNS IP Address obtained from your ISP in the "Server Search Order" location.
- Click "OK" button.

NOTE: 0. The default IP address of ADSL Router is 192.168.1.1 and subnet mask is 255.255.255.0.

1. For the new network computers to use dynamic IP addresses provided by the ADSL Router DHCP server, they should not use the range of fixed IP addresses. For example, the fixed IP addresses already use 192.168.1.2 to 192.168.1.68 the DHCP server must be setup to allocate the dynamic addresses out of this range.

(8) The screen will return back to Network window then click “OK” button. At this moment, the system will prompt you for restarting the Windows. Click “Yes”.

3.3.3. ADSL Router configuration setup

In order to make the whole network operate successfully, it is necessary to configure the ADSL Router through your computer has a web browser installed. Please follow up the steps listed below.

- (1) Double click the Internet web browser icon on your desktop screen (Netscape Communicator 4.0 and Internet Explorer 3.0 or update version).
- (2) Type 192.168.1.1 into the URL web address location and press Enter.

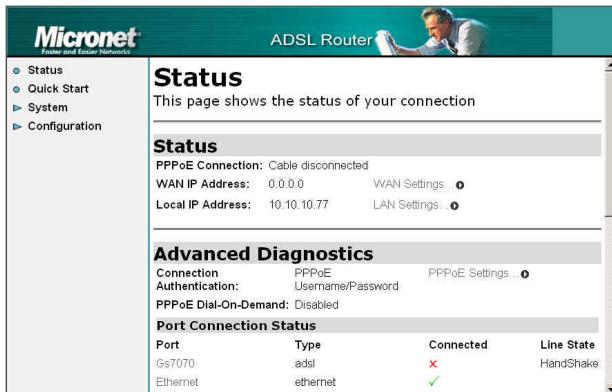


- (3) The Username and Password Required window appears.
 - Enter “admin” in the User name location (default value).
 - Enter “admin” in the Password location (default value).
 - Click “OK” button.



Status

In the home page of the ADSL Router, the left navigation bar shows the options to configure the system. In the right navigation screen is the summary of system status, you could view the configurations or click the short cuts for further system setup.



The screenshot shows the 'Status' page of the Micronet ADSL Router. The left sidebar has links for Status, Quick Start, System, and Configuration. The main content area is titled 'Status' and says 'This page shows the status of your connection'. It shows a 'PPPoE Connection: Cable disconnected'. Below that are 'WAN IP Address: 0.0.0.0' with a 'WAN Settings...' link, and 'Local IP Address: 10.10.10.77' with a 'LAN Settings...' link. A section titled 'Advanced Diagnostics' shows 'Connection: PPPoE', 'Authentication: Username/Password', and 'PPPoE Dial-On-Demand: Disabled'. The 'Port Connection Status' table has three rows: Gs7070 (adsl, disconnected), Ethernet (ethernet, connected). The table has columns for Port, Type, Connected, and Line State.

Quick Start

This page allows you to set up some authentication & login details, which your ISP may require.



The screenshot shows the 'Quick Start' page of the Micronet ADSL Router. The left sidebar has links for Status, Quick Start, System, and Configuration. The main content area is titled 'Quick Start' and says 'This page allows you to set up some authentication & login details which may be required by your ISP'. It has a 'Login Type' section with radio buttons for 'No Login / DHCP' (unchecked) and 'PPPoE Login' (checked). Below that are 'PPPoE Login Setup' fields for Username, Password, and Password (confirm). The 'PPPoE Login Options' section has a 'PPPoE Service Name' field and a 'Dial On Demand' checkbox (unchecked).

(1) Login Type

No Login / DHCP –

If a username and a password are not necessary when establishing your ADSL service, please check this item.

PPPoE Login –

Some ISPs use PPPoE protocol to establish communication and require one set of username and password. If they do, you need to check this item and fill the username and password in the next “PPPoE Login Setup”.

(2) PPPoE Login Setup

Enter your PPPoE Username and Password provided by your ISP.

(3) PPPoE Login Option

PPPoE Service Name --

Some ISPs require PPPoE Service Name when making ADSL service connection.

Dial On Demand –

Enter a number as a predetermined period of time for auto-disconnection. This device can auto-disconnect from the Internet when the idle time (minutes) is up.

Keep Alive –

To keep the line always connected, please check the box.

Domain Name for Clients to send with DNS Requests –

Enter your Domain Name to enable Dynamic DNS service.

Chapter 4

System Configuration of this ADSL Router

The system configurations include five items, Error log, Remote Access, Upgrade, Auto-provisioning and Restart. In this page, system settings and parameters could be launched.

4.1. Error Log:

You can read here system logs and error messages.



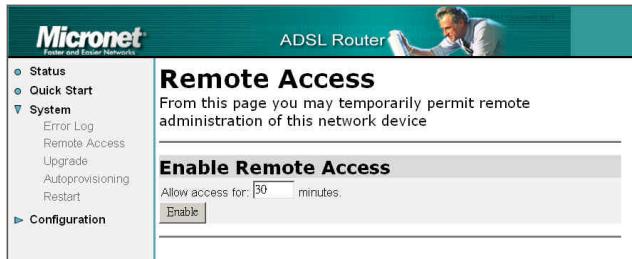
Error log
This page shows recent configuration errors from your router

Error log (most recent errors first, times are in seconds since last reboot):

When	Process	Error
90	autopc	Failed to get service: 1.3.6.1.4:1.353.2.12.2.1.4:6

4.2. Remote Access:

After enabling the NAT function, system may temporarily permit remote administration of this device via WAN port. This feature could prevent outside intruders from accessing this management interface.



The image shows the Micronet ADSL Router's web interface. The top navigation bar includes the 'Micronet' logo, 'Faster and Easier Networks', and the 'ADSL Router' label. A small graphic of a person working on a computer is on the right. The left sidebar has a 'System' section with 'Error Log', 'Remote Access', 'Upgrade', 'Autoprovisioning', and 'Restart' options, and a 'Configuration' section. The main content area is titled 'Remote Access' with the sub-section 'Enable Remote Access'. It shows a form to 'Allow access for: 30 minutes' with an 'Enable' button.

4.3. Upgrade:

You can update the software by yourself easily. Before doing this, you should obtain the newer firmware from your local distributor and save it into the PC's hard disk. Click "Browse" button and specify the file path then click the "Upgrade" button, the upgrade process will begin.

If the upgrade process has been interrupted by any reason (power off, cable plug out etc.), the system will fail. Before performing "Firmware Upgrade" process, ensure a safe operating environment please.



The image shows the Micronet ADSL Router's web interface. The top navigation bar includes the 'Micronet' logo, 'Faster and Easier Networks', and the 'ADSL Router' label. A small graphic of a person working on a computer is on the right. The left sidebar has a 'System' section with 'Error Log', 'Remote Access', 'Upgrade', 'Autoprovisioning', and 'Restart' options, and a 'Configuration' section. The main content area is titled 'Firmware Upgrade' with the sub-section 'Select Upgrade File'. It shows a form with 'New Firmware Image' and a '浏览...' (Browse...) button, and an 'Upgrade' button.

4.4. Autoprovisioning:

If your ISP supports AutoPVC, please enable it here.

Micronet
Faster and Easier Networks

ADSL Router 

Status
 Quick Start
 System
 Error Log
 Remote Access
 Upgrade
 Autoprovisioning
 Restart
 Configuration

Autoprovisioning

Autoprovisioning is disabled.

Autoprovisioning Mode

No autoprovisioning
 AutoPVC (TR37)

Configure

4.5. Restart:

Press the “Restart” button to reboot the ADSL Router. IF you would like to reset all configurations to factory default, please check the “Reset to factory default settings” box.

Micronet
Faster and Easier Networks

ADSL Router 

Status
 Quick Start
 System
 Error Log
 Remote Access
 Upgrade
 Autoprovisioning
 Restart
 Configuration

Reset Router

From this page you may restart your router

Restart

After restarting, please wait for several seconds to let the system come up. If you would like to reset all configuration to factory default settings, please check the following box:

Reset to factory default settings
Warning: Incomplete factory setting recovery procedure will cause the ADSL Router malfunction! Before doing this, please refer to the User's Manual for detail information.

Restart

Chapter 5

Configuration of this ADSL Router

Micronet SP3353 provides strong router functions. In this chapter, we introduce you the configuration step by step. Since the Security is more complicated than others. So we divide the section in the next chapter.

5.1. Save Config:

Click “Save” button here to save and enable the changes you have ever made.



5.2. Authentication:

You can add new user account in this page.



The screenshot shows the 'Authentication' page of a Micronet ADSL Router. The left sidebar has a tree menu with 'Status', 'Quick Start', 'System', 'Configuration' (expanded to show 'Save config', 'Authentication', 'LAN connection', 'WAN connections', 'Static route', 'DHCP server', 'DNS client', 'DNS relay', 'Security'), and 'Ports'. The main content area has a title 'Authentication' with a sub-instruction: 'This page allows you to control access to your router's console and these configuration web-pages'. Below this is a table titled 'Currently Defined Users' with one row for 'admin'. The table has columns for 'User', 'Login enabled?', 'Comment', and 'Edit user'. The 'Edit user' column for 'admin' contains a link with a circled '0'. Below the table is a link 'Create a new User...'. The top of the page features the 'Micronet' logo and 'Faster and Easier Networks' tagline, and the word 'ADSL Router'.

1_ Click “Create a new user”



The screenshot shows the 'Authentication: create user' page. The left sidebar is identical to the previous page. The main content area has a title 'Authentication: create user' and a section 'Details for new user'. It contains fields for 'Username' (a text input box), 'Password' (a text input box), 'Login enabled?' (a dropdown menu set to 'false'), and 'Comment' (a text input box). Below these fields are 'Create' and 'Reset' buttons. At the bottom is a link 'Cancel and return to Authentication Setup Page...'. The top of the page features the 'Micronet' logo and 'Faster and Easier Networks' tagline, and the word 'ADSL Router'.

2_ Enter **Username** and **Password**.

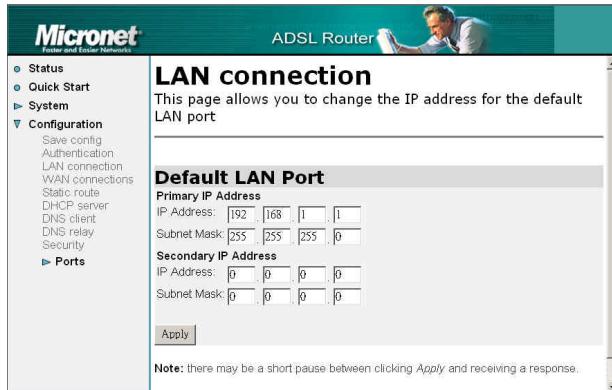
3_ The “Login enabled?” item decides this new user the permission to login to the management console or not. If you choose **false**, this user only has the permission to view **System Status** and **Error Logs**.

4_ Enter the statement in Comment for identification (Optional).

5_ Click “Create” button to add a new user account or “Reset” to clear all value.

5.3. LAN Connection:

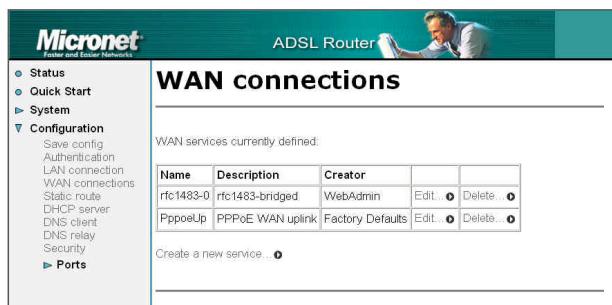
You can change the IP address of your LAN interface here. Basically, the IP address will be the **Default Gateway** and **DNS Server** of your LAN interface.



The screenshot shows the Micronet ADSL Router's LAN connection configuration page. The left sidebar has a tree menu with 'Status', 'Quick Start', 'System', 'Configuration' (expanded to show 'Save config', 'Authentication', 'LAN connection', 'WAN connections', 'Static route', 'DHCP server', 'DNS client', 'DNS relay', 'Security', and 'Ports'), and 'Ports'. The main content area is titled 'LAN connection' with the sub-section 'Default LAN Port'. It shows fields for 'Primary IP Address' (IP Address: 192.168.1.1, Subnet Mask: 255.255.255.0) and 'Secondary IP Address' (IP Address: 0.0.0.0, Subnet Mask: 0.0.0.0). A 'Save' button is at the bottom, and a note below it says: 'Note: there may be a short pause between clicking Apply and receiving a response.'

5.4. WAN Connections:

Under normal circumstances, leave the factory default value of WAN connections could make your ADSL working properly and successfully. In some situation, you may need to assign different system parameters. Please referring to your ISP's technical documents first for correct information or consult an experienced technician for help.



The screenshot shows the Micronet ADSL Router's WAN connections configuration page. The left sidebar has a tree menu with 'Status', 'Quick Start', 'System', 'Configuration' (expanded to show 'Save config', 'Authentication', 'LAN connection', 'WAN connections', 'Static route', 'DHCP server', 'DNS client', 'DNS relay', 'Security', and 'Ports'), and 'Ports'. The main content area is titled 'WAN connections' and shows a table of 'WAN services currently defined'. The table has columns for 'Name', 'Description', 'Creator', 'Edit...', and 'Delete...'. It lists two services: 'rfc1483-0' (Description: rfc1483-bridged, Creator: WebAdmin) and 'PppoeUp' (Description: PPPoE WAN uplink, Creator: Factory Defaults). A 'Create a new service...' button is at the bottom.

Create a new service –

There is a factory default WAN service, click "Edit" / "Delete" for Modify?
Remove the service.

RFC1483 routed: RFC1483 encapsulation routing mode

RFC1483 bridged: RFC1483 encapsulation bridging mode

PPPoA routed: Point-to-Point Protocol over ATM bridged mode

IPoA routed: IP over ATM Routed mode

PPPoE routed: Point-to-Point over Ethernet routed mode

PPTP: Point-to-Point Tunneling Protocol

Edit PPPoE –

After clicking the “Edit” entry, you could modify PPPoE parameters.

Edit “ATM channel” –

The “ATM channel” is very important parameter, please reference to your ISP’s technical documents.

Tx Vci/Vpi – Virtual Circuit / Path Identity of ATM transmission rate

Rx Vci/Vpi Virtual Circuit / Path Identity of ATM receiving rate

Edit IP Interface –

The WAN IP interface values

Edit “RIP Version –

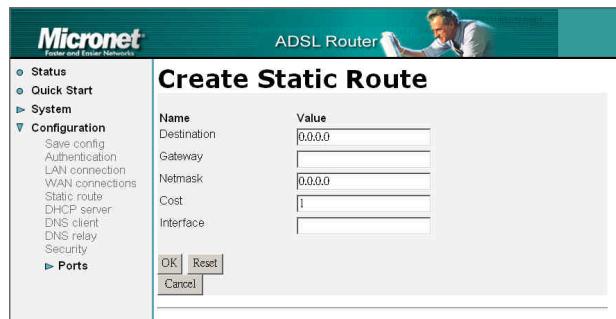
RIP protocol values for routing table exchange

Edit TCP MSS Clamp –

MSS Clamping values

5.5. IP Routes:

You can create a Static Routing table manually to administrate the network traffic when dynamic routing is not effective enough. To start the configuration, click the “Static Route” and fill in the following data.



Destination –

IP addresses of destination hosts you desire to specify a route, for example 203.69.28.0.

Gateway –

The Gateway IP address to the destination network, for example 203.69.28.18.

Netmask –

Network mask of the destination network.

5.6. DHCP Server:

This function assigns IP addresses to local client computers dynamically. The DHCP Server Mode default value is “enable”.

The image shows the Micronet ADSL Router's web-based configuration interface. The top navigation bar includes the brand name 'Micronet' and the model 'ADSL Router'. The left sidebar contains a navigation menu with the following items:

- Status
- Quick Start
- System
- Configuration
 - Save config
 - Authentication
 - LAN connection
 - VAN connections
 - Static route
 - DHCP server
 - DNS client
 - DNS relay
 - Security
- Ports

The main content area is titled 'DHCP server'. It contains two main sections: 'DHCP server status:' and 'Subnet definitions:'.

DHCP server status:

Default Lease Time (secs):	43200
Allow Bootp:	true
Maximum Lease Time (secs):	86400
Allow Unknown Clients:	true
Enabled:	true

Subnet definitions:

Subnet Value:	192.168.1.0
Subnet Mask:	255.255.255.0
Maximum Lease Time (secs):	86400
Default Lease Time (secs):	43200
Router is Dns Server:	true
Router is Default Gateway:	true
Subnet From Interface:	iplan
IP range:	192.168.1.2 - 192.168.1.21

DHCP Server Mode

Mode selection radio buttons:

- Disabled
- DHCP server
- DHCP relay agent

Configure button

5.6.1. DHCP server status:

Default Lease Time –

How many seconds the client computer could use this IP address.

When the Default Lease Time is up, the client computer could extend the lease time until the **Max Lease Time** is up. It can be changed from clicking **Configure** Box.

Allow Bootp –

Some clients acquire an IP address by BOOTP protocol. In this case, you could enable this function. Click Configure Box and Advanced Options, Edit Dhcp Server screen will show in the right frame. Select True or False to control this feature.

Allow Unknown Clients –

Enable the feature can allow Remote clients access your network

Enabled “True” – DHCP Enabled
 “False” – DHCP Disabled

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DHCP: enable server

DHCP Server Setup

Please enter details for DHCP server configuration.

Address Range
Note that your LAN interface has IP address 192.168.1.1, with subnet mask 255.255.255.0, the IP address range should lie within this subnet.

Use Default Range (192.168.1.2 - 192.168.1.21)

Starting IP Address: 192.168.1.2

Ending IP Address: 192.168.1.21

Lease Times

Default Lease Time	43200	seconds
Maximum Lease Time	86400	seconds

Domain Name Servers
List here the primary and secondary domain name servers to be provided to LAN clients.

Use Router as DNS Server

Primary DNS Server Address:

Secondary DNS Server Address:

Default Gateway

Use Router as Default Gateway

Advanced Options... 

Help 

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Edit Dhcp Server

Options

Name	Value
Default Lease Time (secs):	43200
Allow Bootp:	<input checked="" type="checkbox"/>
Maximum Lease Time (secs):	86400
Allow Unknown Clients:	<input checked="" type="checkbox"/>
Enabled:	<input checked="" type="checkbox"/>

Change **Reset**

5.6.2. Subnet definitions:

Subnet Value –

The current Network ID of your LAN, factory default value is 192.168.1.0.

Subnet Mask –

The network mask of your LAN interface

Router is DNS Server –

When DHCP server received a request for leasing an IP address, the specified IP address of DNS server will be sent simultaneously with leased IP address to the client. If you want to specify another DNS server, please fill it in.

"True" -- The ADSL Router acts as a DNS server.

"False" – DNS function disabled

Router is Default Gateway –

When DHCP server received a request for leasing an IP address, the IP address of ADSL Router will be sent simultaneously with leased IP address to the client.

"True" – The ADSL Router is the Default Gateway

"False" –The ADSL Router is not the Default Gateway

5.7. DNS Client:

Enter the DNS server's IP addresses and click "Add" button. Every time when DNS servers reply queries, the ADSL Router makes a copy and saves the record. Next time, when the same domain name is queried again, the ADSL Router replies directly according to the records it saved before.

Domain search order –

This function creates a domain search list. The DNS client uses this list when a user asks for the IP address list for an incomplete domain name. You can have a maximum of 6 incomplete domain names in the search string.

The image shows the Micronet ADSL Router configuration interface. The left sidebar contains a navigation menu with the following items: Status, Quick Start, System, Configuration (expanded), and Ports. The Configuration menu includes sub-options: Save config, Authentication, LAN connection, WAN connections, Static route, DHCP server, DNS client, DNS relay, and Security. The main content area is titled "DNS client". It has two sections: "DNS servers:" and "Domain search order:". Each section has a text input field and an "Add" button. There is also a long, empty text input field below the "Domain search order:" section.

5.8. DNS Relay:

Please enter the DNS server IP address. When client hosts query domain names, ADSK Router will relay the queries to DNS server you specified here.

The image shows the Micronet ADSL Router configuration interface. The left sidebar contains a navigation menu with the following items: Status, Quick Start, System, Configuration (expanded), and Ports. The Configuration menu includes sub-options: Save config, Authentication, LAN connection, WAN connections, Static route, DHCP server, DNS client, DNS relay, and Security. The main content area is titled "DNS relay". It displays the message "The DNS relay is disabled." Below this, there is a section titled "DNS relay mode" with two radio buttons: "Disabled" (selected) and "Enabled". A "Configure" button is also present in this section.

Chapter 6

Security

SP3353 provides powerful security feature. You can set up different Security Level, Firewall Policy etc. just what you need.

6.1. Security:

For security or management consideration, you man need to setup system policies or filters to limit (block) specific IP addresses (ports) from being accessed. The ADLS Router provides various security functions. In this page, you can setup:

- Security State
- Security Level
- Firewall Policy Configuration
- Firewall Trigger Configuration
- Configure Intrusion Detection

Security Interface Configuration

Security State

Security: Enabled Disabled

Firewall: Enabled Disabled

Intrusion Detection Enabled: Enabled Disabled

Security Level

Security Level: n/a (Enable Firewall to set level)

Security Interfaces

Name	Type	NAT
ipwan	external	

Disable NAT to internal interfaces | Delete Interface

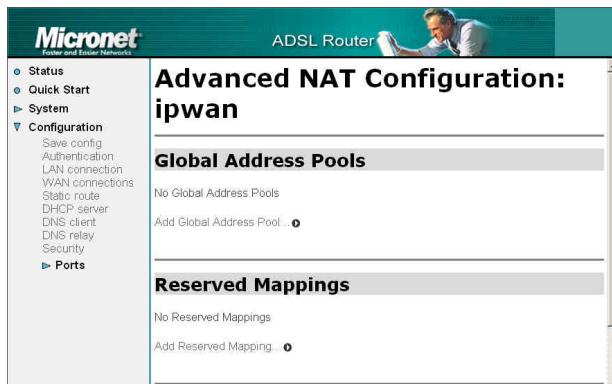
6.2. NAT Configuration:

1. In the Security State / Security item, please select “Enable” radio-button then click “Change State”.
2. Click “Add Interface” under “Security Interfaces” item to add new security interface.
3. Choose “iplan” in “Name” item and “internal” in “Interface Type” item.
4. Click “Apply” button then the “Internal Interface” is added.
5. Repeat the phase 2~4 (Replace “iplan” by “ipwan” and “internal” by “external” in phase 3) to add the “External Interface”.
6. The “Enable NAT to internal interfaces” button under “Security Interfaces” item appears, click it to enable NAT (Network Address Translation) function.

6.3. NAT Advanced Configuration:

6.3.1. Global Address Pools:

A Global Address Pool is a pool of addresses seen from the outside network. The ADSL Router provides one and above WAN IP interface, you can assign another outside interfaces for various purposes.



Use Subnet Mask

1. Enter your IP address in “IP Address” item, for example: 203.69.28.08.
2. Enter net mask in “Subnet Mask/IP Address” item, for example: 255.255.255.0.
3. Click “Add Global Address Pool” button to add IP address 203.69.28.08.



Use IP Address Range

1. Enter starting IP address of a range in the “IP Address” item, for example: 203.69.28.08.
2. Enter starting IP address of a range in the “Subnet Mask/IP Address” item, for example: 203.69.28.36.
3. Click “Add Global Address Pool” button to add the IP address 203.69.28.08~203.69.28.36.

Reserved Mappings

A reserved mapping is used so that NAT knows where to route packets on inbound sessions. The reserved mapping will map a specific global address and port to an inside address and port. Refer to the following

Reserved Mapping table, when an Internet Browser (Internet Explorer, Netscape Navigator) knocks port-80 of the Global IP Address --- 203.69.28.08, the Internal IP Address 192.168.1.2 provides HTTP service.

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Firewall Add Reserved Mapping: ipwan

Add Reserved Mapping

Global IP Address	Internal IP Address	Transport Type	Port Number
203.69.28.9 (Set to 0.0.0.0 to use the primary IP address of the interface "ipwan")	192.168.1.9	tcp	80

[Add Reserved Mapping](#)

[Return to NAT Configuration](#)

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ADSL Router

Advanced NAT Configuration: ipwan

Global Address Pools

Interface Type	Use Subnet Configuration	IP Address	Subnet Mask/IP Address 2	
internal	false	203.69.28.8	203.69.28.17	Delete
internal	true	203.69.28.18	255.255.255.0	Delete

[Add Global Address Pool](#)

Reserved Mappings

Reserved Mappings				
Global IP Address	Internal IP Address	Transport Type	Port Number	
203.69.28.9	192.168.1.9	tcp	80	Delete

[Add Reserved Mapping](#)

[Return to Interface List](#)

6.4. Firewall Policy Configuration:

The firewall policy could obstruct outside intruders from intruding your system. After selecting a security level, the preset firewall policies are implemented.

Interface Type 1	Interface Type 2	Validators	Policy Configuration
external	internal	Only listed hosts blocked	Port Filters: 0 Host Validators: 0

Port filters

Port filters are rules that determine how a packet should be handled. Refer to the following Port filters table; users in the LAN side could access the port 21 (ftp) and port 80 (http) services in the Internet. But outside users who access the port 21 and port 80 via WAN port of the device are not allowed.

- Status
- Quick Start
- ▶ System
- ▼ Configuration
 - Save config
 - Authentication
 - LAN connection
 - WAN connections
 - Static route
 - DHCP server
 - DNS client
 - DNS relay
 - Security
- ▶ Ports

Firewall Port Filters: external-internal

Port Filters					
Transport Type	Port Start	Port End	Inbound	Outbound	
8	22	22	false	false	Delete
6	1503	1503	false	false	Delete
8	1720	1720	false	false	Delete
1	N/A	N/A	false	true	Delete
17	7070	7070	false	false	Delete
8	119	119	false	false	Delete
6	110	110	false	true	Delete
6	25	25	false	true	Delete
6	23	23	false	false	Delete
6	21	21	false	false	Delete
8	53	53	false	true	Delete
17	53	53	false	true	Delete
6	80	80	false	true	Delete

[Add TCP Filter](#)

[Add UDP Filter](#)

[Add Raw IP Filter](#)

[Return to Policy List](#)

[Return to Interface List](#)

Host Validator

The ADSL Router could filter the incoming / outgoing packets for security or management consideration. You can set up the filter against the IP addresses to block specific internal users from accessing / being accessed the Internet. Refer to the following Host Validator table:

1. Any access intention incoming from WAN port to the internal IP address 192.168.3 will be blocked.
2. Any incoming / outgoing access intention come to / from the IP addresses in the range of 192.168.1.128 ~ 192.168.1.143 will be blocked.

Configure Validators: external-internal'

Host Validators

Host IP Address	Host Subnet Mask	Direction	Action
192.168.1.133	255.255.255.240	both	Delete Host Validator...
192.168.1.3	255.255.255.0	inbound	Delete Host Validator...

Add Host Validator...

[Return to Policy List...](#)

[Return to Interface List...](#)

6.5. Firewall Trigger Configuration:

Security triggers are used to deal with application protocols that create separate sessions. Some application protocols open secondary connections during normal operations. The most common example of this is FTP. Rather than allowing a range or port numbers, triggers handle the situation dynamically, allowing the secondary sessions on when appropriate. After selecting a security level, the preset Firewall Triggers are implemented.

Firewall Trigger Configuration

Current Firewall Triggers

Firewall Triggers									
Transport Type	Port Number Start	Port Number End	Allow Multiple Hosts	Max Activity Interval	Enable Session Chaining	Enable UDP Session Chaining	Binary Address Replacement	Address Translation Type	Action
tcp	51210	51210	false	3000	true	false	false	none	
udp	51200	51201	false	3000	false	false	false	none	
tcp	1720	1720	false	30000	true	false	true	tcp	
tcp	21	21	false	3000	false	false	false	none	

New Trigger

[Return to Interface List...](#)

Allow Multiple Hosts

Allows multiple hosts to use the same port or not.

Max Activity Interval

The trigger open up until Max Activity Interval expires.

Enable Session Chaining (UDP)

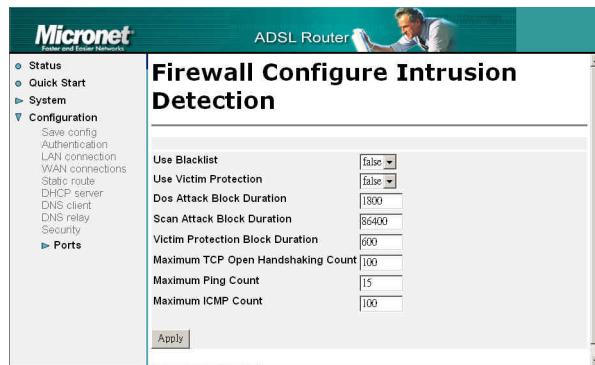
Session chaining which is not needed for FTP but is needed for some applications, like NetMeeting.

Binary Address Replacement / Address Translation Type

Some applications embed address and / or port information in the payload of the packet. This function allows you to specify what type of address replacement is set on a trigger. Incoming packets are searched in order to find their embedded IP address. The address is then replaced by the correct inside host IP address, and NAT translates the packets to the correct destination.

Configure Intrusion Detection

Key in the detection requirement then click Apply box to enable this function.



Chapter 7

Hardware Setting

In this chapter, we discuss the hardware settings. These settings will influence the handshaking with DSLAM. Please don't change the value unless your telephone service provider does.

7.1. Gs7070:

These are basic port attributes of ADSL port.

Name	Value
DSPFirmware Version	51051
Connected	false
Connect Mode	adslt
Operational Mode	Inactive
Near End SEF	0
Near End LOS	0
Near End Fast Channel Rx Rate	0
Near End Fast Channel Tx Rate	0
Near End Fast Channel FEC	0
Near End Fast Channel CRC	0
Near End Fast Channel HEC	0
Near End Fast Channel NCD	0
Near End Fast Channel OCD	0
Near End Interleaved Channel Rx Rate	0
Near End Interleaved Channel Tx Rate	0
Near End Interleaved Channel FEC	0
Near End Interleaved Channel CRC	0
Near End Interleaved Channel HEC	0
Near End Interleaved Channel NCD	0
Near End Interleaved Channel OCD	0
Far End SEF	0

Far End Sync	0
Far End LOS	0
Far End Fast Channel FEC	0
Far End Fast Channel CRC	0
Far End Fast Channel HEC	0
Far End Fast Channel NCD	0
Far End Interleaved Channel FEC	0
Far End Interleaved Channel CRC	0
Far End Interleaved Channel HEC	0
Far End Interleaved Channel NCD	0
Tx Bit Rate	0
Rx Bit Rate	0
Tx Cell Rate	0
Rx Cell Rate	0
Last Fail Status	0
Annex Type	AnnexB
Tx Attenuation	0
Activate Line	<input type="checkbox"/>
Downstream Snr Margin	not showtime
Upstream Attenuation	not showtime
Downstream Attenuation	not showtime
Upstream Transmit Power	not showtime
Downstream Transmit Power	not showtime
Port Speed	59111
VPIRange	12
VCIRange	16
Default PCR	2000
<input type="button" value="Apply"/> <input type="button" value="Reset"/>	

7.2. Ethernet:

These are basic port attributes of Ethernet port.


ADSL Router 

- Status
- Quick Start
- System
- Configuration

- Ports
- Gs7070
- Ethernet

Ethernet Port Configuration

[View advanced attributes...](#)

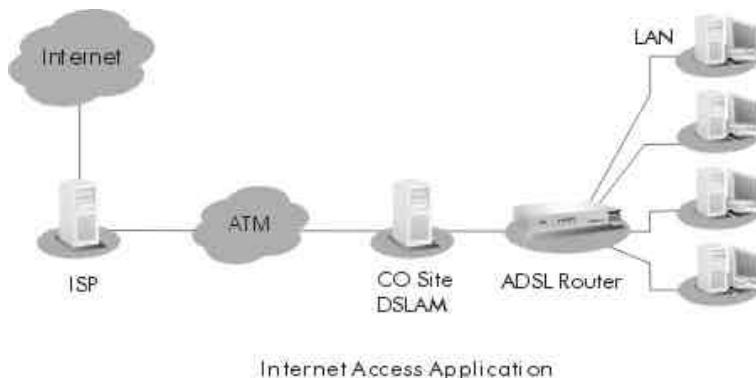
Basic Port Attributes	
Name	Value
Version	1.01
100Base	true
Connected	true
Full Duplex	true
Link Speed	10000000

Chapter 7

Application of SP3353

7.1. Internet Access

BroadLink SP3353 is the ideal high-speed Internet access solution. It supports the TCP/IP protocol, which the Internet uses exclusively and compatible with all major ADSL DSLAM (Digital Subscriber Line Access Multiplexer) providers. Think of it as the equivalent of a modem rack for ADSL. A typical Internet Access application is shown below. It allows multiple users on the LAN to access the Internet concurrently by sharing Single User Account.



7.2. Port Forwarding

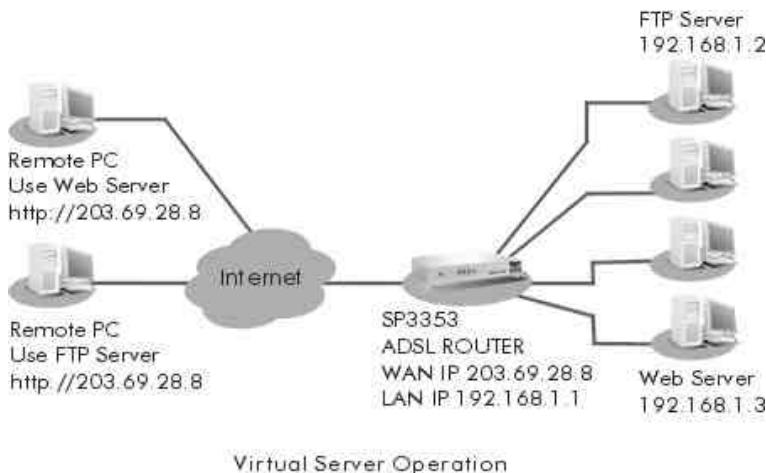
In many cases, Port Forwarding is called "Virtual Server". The Virtual Servers feature allows Internet users to access standard Servers on your LAN, via the Internet IP Sharer. Normally, Internet users would not be able to access a server on your LAN because:

Your Server does not have a valid external IP Address.

Attempts to connect to devices on your LAN are blocked by the firewall in this device.

The "Virtual Server" feature solves these problems and allows Internet users to connect to your servers. However, your LAN must have an existing connection to the Internet.

Virtual Server operation is illustrated below.



Both Internet users are connecting to the same IP Address, but using different protocols. To Internet users, all virtual Servers on your LAN have the same IP Address. This IP Address is the IP Address allocated by ISP on the Internet Account screen, for the port(s) which you are using. This address should be static, rather than dynamic, to make it easier for Internet users to connect to your Servers.

The Internet IP Sharer supports two (2) types of Virtual Servers:

Standard - Standard server types (Web, FTP, etc) are pre-defined. The only data required is the IP Address of the server on your LAN.

User-defined - Non-standard servers. You must provide additional information about the server.

Note that the TOTAL number of Virtual Servers which can be used is 10.

7.3. NAT Port Mapping

If your ADSL account within multi-real IP Addresses then Multi-Global IP mapping function is a useful feature for Internet application. The Multi-Global IP mapping function helps you dividing the client PCs on the LAN into several groups and each group access Internet through one real IP Address. You also can set single local IP Address map to single Global IP Address. Thus it empowers the management and provides much wider application over ADSL line.

7.4. DNS setting

Domain Name System links names to IP addresses. When you access Web sites on the Internet, you can type the IP address of the site or the DNS name. When you type a domain name in a Web browser, a query is sent to the primary DNS server defined in your Web browser's configuration dialog box. The DNS server converts the name you specified to an IP address and returns this address to your system. From then on, the IP address is used in all subsequent communications.

SP3353 design DNS in DHCP Parameter. It keeps three Name Server for user's application. You can key in your DNS server in the three boxes. You also can skip the setting, it will be auto assigned by your ISP.

7.5. AutoPVC

AutoPVC(TR 37) covers auto-configuration for the connection between the DSL broadband network termination and the network, using ATM. DSL Forum and ATM Forum have worked in parallel on this aspect of auto-configuration, drawing on the existing work of both organisations to provide an integrated technical solution.

7.5.1. ATM Switch

ATM is a connection oriented packet switching technology using fixed size packets, called cells. These cells consist of a header and a payload and are switched through a public or private ATM network depending on the contents of the header. End-to-end connections are formed by cross connecting individual ATM segments in ATM switches. Each ATM cell carries two labels called Virtual Path Identifier (VPI) and Virtual Channel Identifier (VCI) as part of its header.

An ATM channel, commonly referred to as Virtual Channel, is fully identified by these two labels. Therefore, multiple ATM channels can reside on your DSL line. All ATM connections are static, i.e. of type Permanent Virtual Channel (PVC).

7.5.2. ATM traffic handling

ATM traffic at SP3353 is switched to the Ethernet port. Inside ATM VCs any protocol can be transported. However, at both endpoints (the ATM channels are terminated), the same protocol must be supported. If not, there will be no end-to-end connectivity. Only frames recognized/ supported by SP3353 on a particular ATM connection are extracted, or encapsulated.

Currently the supported encapsulations are:

- (1) Transparently Bridged connections – RFC 1483, Ethernet V2.0/IEEE 802.3 bridged PDUs for both the LLC/SNAP method and VC-MUX method
- (2) Bridged PPPoE connections – RFC 1483, Ethernet V2.0/IEEE 802.3 bridged PDUs for both the LLC/SNAP method and VC-MUX method
- (3) PPPoA-to-PPTP Relaying connections – RFC 2364, PPP PDUs for both the LLC/NLPID method and VC-MUX method.

The default VCs can be remotely modified via the AutoPVC feature. AutoPVC operated only when your ISP supports this function. SP3353 supports this function. You can enable the function by only checking the radio box.

Chapter 8

Appendix

Service Name, Protocol and Port number

Service	Protocol	Port	Service	Protocol	Port
ANY	Any	Any	AOL	TCP	5190-5194
BGP	TCP	179	Finger	TCP	79
FTP	TCP	20-21	Gopher	TCP	70
HTTP	TCP	80	HTTPS	TCP	443
IMAP	TCP	143	InterLocator	TCP	389
IRC	TCP	6660-6669	L2TP	TCP	1701
VDOLive	TCP	7000-7010	WAIS	TCP	210
WINFRAME	TCP	1494	X-WIN	TCP	6000-6030
DNS	UDP	53	IKE	UDP	500
NFS	UDP	111	NTP	UDP	123
PC-Anywhere	UDP	123	RIP	UDP	520
SNMP	UDP	161	SYSLOG	UDP	514
TALK	UDP	517-518	TFTP	UDP	69
UDP-Any	UDP	Any	UUCP	UDP	540
PING	ICMP	ANY	TRACEROUTE	ICMP	Any

Chapter 9

Glossary

A

Address mask

A bit mask used to select bits from an Internet address for subnet addressing. The mask is 32 bits long and selects the network portion of the Internet address and one or more bits of the local portion. Sometimes called subnet mask.

AAL5

ATM Adaptation Layer - This layer maps higher layer user data into ATM cells, making the data suitable for transport through the ATM network.

ADSL

Asymmetrical Digital Subscriber Line is an asymmetrical technology, meaning that the downstream data rate is much higher than the upstream data rate. ADSL operates in a frequency range that is above the frequency range of voice services, so the two systems can operate over the same cable.

ATU-C and ATU-R

ADSL Transmission Unit, Central or Remote: the device at the end of an ADSL line that stands between the line and the first item of equipment in the subscriber premises or telephone switch. It may be integrated within an access node.

ARP

Address Resolution Protocol is a protocol for mapping an Internet Protocol address (IP address) to a physical machine address that is recognized in the local network.

ATM

Asynchronous Transfer Mode - A cell-based data transfer technique in which channel demand determines packet allocation. ATM offers fast packet technology, real time, demand led switching for efficient use of network resources.

B

Backbone

A high-speed line or series of connections that forms a major pathway within a network.

Bandwidth

This is the capacity on a link usually measured in bits-per-second (bps).

Bit and Byte

(Binary Digit) -- A single digit number in base-2, in other words, either a 1 or a zero. The smallest unit of computerized data. A set of bits that represent a single character. There are 8 bits in a Byte.

Bridge

A device connects two or more physical networks and forwards packets between them. Bridges can usually be made to filter packets, that is, to forward only certain traffic. Related devices are: repeaters which simply forward electrical signals from one cable to the other, and full-fledged routers which make routing decisions based on several criteria.

Broadband

High-speed transmission. The term is commonly used to refer to communications lines or services at T1 rates (1.544 Mbps) and above. The speed threshold of broadband is subjective and can be above or below T1. Some claim 45 Mbps is the starting point of broadband. In every case however, it implies transmitting at higher speeds than what was common before. Broadband often refers to Internet access using cable modems and DSL, both of which deliver speeds above and below T1.

C

CHAP

Challenge Handshake Authentication Protocol is an alternative protocol that avoids sending passwords over the wire by using a challenge/response technique.

Client

A software program that is used to contact and obtain data from a Server software program on another computer. Each Client program is designed to work with one or more specific kinds of Server programs, and each Server requires a specific kind of Client. A Web Browser is a specific kind of Client.

CO

Central Office. Refers to equipment located at a Telco or service provider's office.

CPE

Customer Premises Equipment located in a user's premises

Crossover Ethernet Cable

A cable that wires a pin to its opposite pin, for example, RX+ is wired to TX+. This cable connects two similar devices, for example, two data terminal equipment (DTE)

or data communications equipment (DCE) devices.

CSU/DSU

Channel Service Unit/Data Service Unit. CSUs (channel service units) and DSUs (data service units) are actually two separate devices, but they are used in conjunction and often combined into the same box. The devices are part of the hardware you need to connect computer equipment to digital transmission lines). The Channel Service Unit device connects with the digital communication line and provides a termination for the digital signal. The Data Service Unit device, sometimes called a digital service unit, is the hardware component you need to transmit digital data over the hardware channel. The device converts signals from bridges, routers, and multiplexors into the bipolar digital signals used by the digital lines. Multiplexors mix voice signals and data on the same line.

D

DCE

Data Communications Equipment is typically a modem or other type of communication device. The DCE sits between the DTE (data terminal equipment) and a transmission circuit such as a phone line.

DHCP

Dynamic Host Configuration Protocol automatically assigns IP addresses to clients when they log on. DHCP centralizes IP address management on central computers that run the DHCP server program. DHCP leases addresses for a period of time which means that addresses are made available to assign to other systems.

DMT

Discrete Multi-Tone frequency signal modulation

DNS

Domain Name System links names to IP addresses. When you access Web sites on the Internet, you can type the IP address of the site or the DNS name. When you type a domain name in a Web browser, a query is sent to the primary DNS server defined in your Web browser's configuration dialog box. The DNS server converts the name you specified to an IP address and returns this address to your system. From then on, the IP address is used in all subsequent communications.

Domain Name

The unique name that identifies an Internet site. Domain Names always have 2 or more parts, separated by dots. The part on the left is the most specific, and the part on the right is the most general.

Downstream rate

The line rate for return messages or data transfers from the network machine to the user's premises machine.

DSL

Digital Subscriber Line technologies enhances the data capacity of the existing twisted-pair wire that runs between the local telephone company switching offices and most homes and offices. There are actually seven types of DSL service, ranging in speeds from 16 Kbits/sec to 52 Mbits/sec. The services are either symmetrical (traffic flows at the same speed in both directions), or asymmetrical (the downstream capacity is higher than the upstream capacity). DSL connections are point-to-point dedicated circuits, meaning that they are always connected. There is no dial-up. There is also no switching, which means that the line is a direct connection into the carrier's frame relay, ATM (Asynchronous Transfer Mode), or Internet-connect system.

DSLAM

A Digital Subscriber Line Access Multiplexer (DSLAM) is a network device, usually

at a telephone company central office, that receives signals from multiple customer Digital Subscriber Line connections and puts the signals on a high-speed backbone line using multiplexing techniques. Depending on the product, DSLAM multiplexers connect DSL lines with some combination of asynchronous transfer mode ATM, frame relay, or IP networks.

DTE

Originally, the DTE (Data Terminal Equipment) was a dumb terminal or printer, but today it is a computer, or a bridge or router that interconnects local area networks.

Dynamic IP Addresses

A dynamic IP address is an IP address that is automatically assigned to a client station (computer, printer, etc.) in a TCP/IP network. Dynamic IP addresses are typically assigned by a DHCP server, which can be a computer on the network or another piece of hardware, such as the Router. A dynamic IP address may change every time your computer connects to the network.

E

Encapsulation

The technique used by layered protocols in which a layer adds header information to the protocol data unit (PDU) from the layer above. As an example, in Internet terminology, a packet would contain a header from the physical layer, followed by a header from the network layer (IP), followed by a header from the transport layer (TCP), followed by the application protocol data.

Ethernet

A very common method of networking computers in a LAN. There are a number of adaptations to the IEEE 802.3 Ethernet standard, including adaptations with data rates of 10 Mbits/sec and 100 Mbits/sec over coaxial cable, twisted-pair cable, and

fiber-optic cable. The latest version of Ethernet, Gigabit Ethernet, has a data rate of 1 Gbit/sec.

G

Gateway

A gateway is a computer system or other device that acts as a translator between two systems that do not use the same communication protocols, data formatting structures, languages, and/or architecture.

H

Host

Any computer on a network that is a repository for services available to other computers on the network. It is quite common to have one host machine provide several services, such as WWW and USENET.

I

ICMP

Internet Control Message Protocol is a message control and error-reporting protocol between a host server and a gateway to the Internet. ICMP uses Internet Protocol (IP) datagrams, but the messages are processed by the TCP/IP software and are not directly apparent to the application user.

IP

Internet Protocol. The IP (currently IP version 4, or IPv4), is the underlying protocol

for routing packets on the Internet and other TCP/IP-based networks.

IPCP (PPP)

IP Control Protocol allows changes to IP parameters such as the IP address.

M

MAC

On a local area network (LAN) or other network, the MAC (Media Access Control) address is your computer's unique hardware number. (On an Ethernet LAN, it's the same as your Ethernet address.) The MAC layer frames data for transmission over the network, then passes the frame to the physical layer interface where it is transmitted as a stream of bits.

N

NAT

Network Address Translation is the translation of an Internet Protocol address used within one network to a different IP address known within another network.

Node

Any single computer connected to a network.

P

POTS

Plain Old Telephone Service - This is the term used to describe basic telephone service.

PPP

Point to Point Protocol. PPP encapsulates and transmits IP (Internet Protocol) datagrams over serial point-to-point links. PPP works with other protocols such as IPX (Internetwork Packet Exchange). The protocol is defined in IETF (Internet Engineering Task Force) RFC 1661 through 1663. PPP provides router-to-router, host-to-router, and host-to-host connections.

PPPoE

PPP over Ethernet is a protocol for connecting remote hosts to the Internet over an always-on connection by simulating a dial-up connection.

PSTN

Public Switched Telephone Network was put into place many years ago as a voice telephone call-switching system. The system transmits voice calls as analog signals across copper twisted cables from homes and businesses to neighborhood COs (central offices); this is often called the local loop. The PSTN is a circuit-switched system, meaning that an end-to-end private circuit is established between caller and callee.

PVC

Permanent Virtual Circuit. A PVC is a logical point-to-point circuit between customer sites. PVCs are low-delay circuits because routing decisions do not need to be made along the way. Permanent means that the circuit is preprogrammed by the carrier as a path through the network. It does not need to be set up or torn down for each session.

R

RFC

An RFC (Request for Comments) is an Internet formal document or standard that is the result of committee drafting and subsequent review by interested parties. Some RFCs are informational in nature. Of those that are intended to become Internet standards, the final version of the RFC becomes the standard and no further comments or changes are permitted. Change can occur, however, through subsequent RFCs.

RIP

Routing Information Protocol is an interior or intra-domain routing protocol that uses the distance-vector routing algorithms. RIP is used on the Internet and is common in the NetWare environment as a method for exchanging routing information between routers.

Router

A system responsible for making decisions about which of several paths network (or Internet) traffic will follow. To do this, it uses a routing protocol to gain information about the network and algorithms to choose the best route based on several criteria known as "routing metrics".

Routing table

Information stored within a router that contains network path and status information. It is used to select the most appropriate route to forward information along.

Routing Information Protocol

Routers periodically exchange information with one another so that they can determine minimum distance paths between sources and destinations.

S

Server

A computer, or a software package, that provides a specific kind of service to client software running on other computers.

SNMP

System Network Management Protocol is a popular management protocol defined by the Internet community for TCP/IP networks. It is a communication protocol for collecting information from devices on the network.

Spanning-Tree Bridge Protocol (STP)

Spanning-Tree Bridge Protocol (STP) - Part of an IEEE standard. A mechanism for detecting and preventing loops from occurring in a multi-bridged environment.

When three or more LAN's segments are connected via bridges, a loop can occur. Because a bridge forwards all packets that are not recognized as being local, some packets can circulate for long periods of time, eventually degrading system performance. This algorithm ensures only one path connects any pair of stations, selecting one bridge as the 'root' bridge, with the highest priority one as identifier, from which all paths should radiate.

Spoofing

A method of fooling network end stations into believing that keep alive signals have come from and returned to the host. Polls are received and returned locally at either end

Static IP Addresses

A static IP address is an IP address permanently assigned to computer in a TCP/IP network. Static IP addresses are usually assigned to networked devices that are consistently accessed by multiple users, such as Server PCs, or printers. If you are using your Router to share your cable or DSL Internet connection, contact your ISP

to see if they have assigned your home a static IP address. You will need that address during your Router's configuration.

STP

Twisted-pair cable consists of copper-core wires surrounded by an insulator. Two wires are twisted together to form a pair, and the pair form a balanced circuit. The twisting prevents interference problems. STP (shielded twisted-pair) provides protection against external crosstalk.

Straight Through Ethernet Cable

A cable that wires a pin to its equivalent pin. This cable connects two dissimilar devices, for example, a data terminal equipment (DTE) and a data communications equipment (DCE) device. A straight through Ethernet cable is the most common cable used.

Subnet

For routing purposes, IP networks can be divided into logical subnets by using a subnet mask. Values below those of the mask are valid addresses on the subnet.

T

TCP

Transmission Control Protocol - The major transport protocol in the Internet suite of protocols provides reliable, connection-oriented full-duplex streams.

Telnet

Telnet is the login and terminal emulation protocol common on the Internet and in UNIX environments. It operates over TCP/IP networks. Its primary function is to allow users to log into remote host systems.

TFTP

Trivial File Transfer Protocol - A simple file transfer protocol (a simplified version of FTP) that is often used to boot diskless workstations and other network devices such as routers over a network (typically a LAN).VCI

U

UDP

User Datagram Protocol - A connectionless transport protocol that runs on top of TCP/IP's IP. UDP, like TCP, uses IP for delivery; however, unlike TCP, UDP provides for exchange of datagrams without acknowledgments or guaranteed delivery. Best suited for small, independent requests, such as requesting a MIB value from an SNMP agent, in which first setting up a connection would take more time than sending the data.

UNI signaling

User Network Interface signaling for ATM communications.

V

Virtual Channel Identifier

Identifies virtual channels between users or between users and networks.

Virtual Connection (VC)

A link that seems and behaves like a dedicated point-to-point line or a system that delivers packets in sequence, as happens on an actual point-to-point network. In reality, the data is delivered across a network via the most appropriate route. The sending and receiving devices do not have to be aware of the options and the route

is chosen only when a message is sent. There is no pre-arrangement, so each virtual connection exists only for the duration of that one transmission.

VPI

Virtual Path Identifier. Identifies virtual paths between users or between users and networks.

W

WAN

Wide Area Networks link geographically dispersed offices in other cities or around the globe. Just about any long-distance communication medium can serve as a WAN link, including switched and permanent telephone circuits, terrestrial radio systems, and satellite systems.